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ADDITIONS TO RAMULARA AND CERCOSPORA.

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RAMULARIA VERONICÆ, Fckl. Symb., p. 361.—On leaves of *Veronica peregrina*, Racine, Wis., May, 1887, Dr. J. J. Davis. Tufts amphigenous, white, abundant, covering both surfaces of the leaves, especially the tips, which soon become discolored and dead; hyphæ slender, continuous, granular, simple, subdentate above, 20—30 x 2½—3 *u*, arising from a tubercular base; conidia cylindrical, granular, continuous, ends obtuse, 20—30 x 3 *u*.

The above description does not agree well with that given by Fuckel, who says "conidiis cylindraceis ellipticisve, magnitudine varia, simplicibus." The specimens in de Thumen's Austrian Fungi, 892, on *Veronica hederæfolia*, have the conidia broader and shorter, 12—20 x 4 *u*, but do not differ in other respects. The specimens in our copy of Mycotheca Marchica (798), on *Veronica officinalis*, show neither hyphæ nor conidia. Saccardo places this in his genus *Ovularia*, but no *elliptical* conidia were seen in the Wisconsin specimens, which do not seem to us specifically distinct. It is more probable that the form of the conidia may vary on the different species of the host, as Fuckel makes them either cylindrical or elliptical.

RAMULARIA SIDALCEÆ, E. & E.—On *Sidalceæ*. British Columbia, July, 1887, Prof. J. Macoun. Maculicolous; spots amphigenous, 2—4 millim. in diameter, dark purple, with a dirty whitish or grayish center and subindefinite margin; fertile hyphæ hypophyllous, arising in dense fascicles through the stomata of the leaf, hyaline, simple, 15—20 x 3 *u*, subdenticulate and subangularly bent above, or entire; conidia subcatenulate, hyaline, oblong or oblong-cylindrical, continuous or uniseptate, 12—22 x 2½—3 *u*. This seems to be quite different from *Ramularia Malvæ*, Fckl.

RAMULARIA LIRIODENDRI, E. & E.—On living leaves of *Liriodendron Tulipifera*. Faulkland, Del., August, 1887, A. Commons. Maculicolous; spots amphigenous, ochraceous, about one-half cm. in diameter, with a darker border; hyphæ hypophyllous, 15—40 x 3 *u*, continuous or 1—2-septate, hyaline, tips often oblique; conidia variable, acutely elliptical, 5—6 x 3 *u* or elongated, cylindrical, 12—20 x 3 *u*, continuous or one-septate, hyaline, ends mostly acute. On the same spots on the upper side of the leaves was *Gloeosporium Liriodendri*, E. & E.

RAMULARIA ROSEA (Fckl.) Sacc. Syll., III, p. 199.—*Fusidium roseum*, Fckl. Symb., p. 370.—What we take to be this species has been sent from Racine, Wis., by Dr. J. J. Davis, on leaves of *Salix rostrata*. Spots irregular, 1—3 millim., dark brown, almost black above, paler beneath; hyphæ mostly hypophyllous, fasciculate, simple or occasionally branched, mostly with one or two shoulder-like notches or teeth above, nearly straight, hyaline, 25—35 x 2—2½ *u*; conidia subcatenulate, fusoid, granular and nucleate, 12—22 x 2 *u*. The specimens in de Thumen's Mycotheca Universalis, No. 380, seem different from this.

RAMULARIA SUBRUFA, Ell. and Holway.—On living leaves of *Smilax*, Decorah, Iowa, June, 1885, E. W. Holway, No. 376. Hypophyllous, occupying the areas formed by the veinlets of the leaf, soon subseriate, confluent, subrufous or grayish, with the margin lighter. The surface of the leaf in the affected parts is first overspread with a layer of interwoven, branching, prostrate threads, sending up from numerous points of greater condensation fascicles of fertile hyphæ, 25—35 x 3 *u*, continuous, but more or less denticulate or lobed above and bearing an abundant crop of oblong-cylindrical, concatenate, 1—3-septate (mostly one-septate), 15—25 x 3½—4 *u* conidia, obtusely pointed at the end and mostly straight, nearly hyaline but with a distinct yellowish tinge. The separate hyphæ are also nearly hyaline, but in the mass both these and the conidia are yellowish-brown. This is an anomalous species, both on account of the abundant prostrate hyphæ and the color of the conidia, which in all other respects are those of typical *Ramularia*. The leaf is spotted above with reddish-brown, becoming darker.

RAMULARIA CONCOMITANS, Ell. & Holway.—On leaves of *Bidens*, Decorah, Iowa, October, 1885. Spots amphigenous, yellowish-white, definite, suborbicular, 2—4 millim., mostly with a narrow, dark, slightly raised border above; hyphæ fasciculate, short, amphigenous but mostly hypophyllous; conidia cylindrical, with the ends subacute, one-septate or occasionally two-septate, 15—22 x 3—4 *u*, concatenate in series of 3—5. Accompanying *Cercospora umbrata*, Ell. & Hol.

CERCOSPORA GENTIANICOLA, E. & E.—On withered leaves of *Gentiana crinita*. Faulkland, Del., October, 1887. A. Commons, No. 728. Tufts hypophyllous, minute, effused over a large part of the lower side of the leaf; hyphæ brownish, simple, short (15—20 *u*) on a small tubercular base; conidia subcylindrical, slightly narrowed above, hyaline, nucleate and faintly 2—3-septate, a little curved, 40—60 x 3½ *u*.

CERCOSPORA VERBASCICOLA, E. & E.—On living leaves of *Verbascum Thapsus*. Delaware, Commons, No. 669. Maculicolous; spots amphigenous, round, dirty brown, whitening out, 2—4 millim. in diameter; hyphæ slender, cylindrical, brown, septate, nearly entire above, 75—175 x 3 *u*, forming scanty, scattered tufts; conidia almost filiform, hyaline, distantly septate, 100—150 x 3 *u*, mostly epiphyllous.

CERCOSPORA SABBATIÆ, E. & E.—On leaves of *Sabbatia angularis*, Faulkland, Del., August, 1887. Amphigenous; tufts scattered, minute, grayish; hyphæ cæspitose, continuous, smoky-brown, 35—45 x 5 *u*, on a small tubercular base; conidia obclavate, subhyaline, 3—6-septate, 65—80 x 4 *u*. There are no definite spots, but the parts of the leaf affected soon become yellow.

CERCOSPORA LATENS, E. & E.—On leaves of *Psoralea argophylla*. Kansas, June, 1887, W. T. Swingle. Epiphyllous, on dark brown, subconfluent, subindefinite spots, with which the leaves are thickly mottled; hyphæ very obscure, 10—15 x 3 *u*, continuous, subhyaline, arising from a tubercular base; conidia slender, obclavate, granular and nucleate, becoming multiseptate, 75—100 x 4 *u*. This is quite different from *C. passalaroides*, Winter, which has longer, stouter and darker hyphæ and conidia.

CERCOSPORA CUCURBITÆ, E. & E.—On *Cucurbita perennis*. Manhattan, Kans., July, 1887, W. T. Swingle. Maculicolous; spots amphigenous, round, subochraceous, soon becoming thin, white and semitransparent, 1—4 millim. in diameter, with border slightly raised; hyphæ epiphyllous, tufted, olive brown, paler above, 70—80 x 4 *u*, continuous, subgeniculate above and obtuse at the apex; conidia linear-clavate, 100—150 x 3—4 *u*, hyaline, granular and nucleate at first, becoming at length septate (multiseptate [?])

CERCOSPORA SILPHII, E. & E.—On fallen leaves of *Silphium integrifolium*. Manhattan, Kans., July, 1887, W. T. Swingle. Amphigenous, but more abundant below, on subangular, 2—3 millim., dirty white spots, with a raised border, or on the lower surface of the leaf more or less effused; hyphæ cæspitose on a tubercular base, pale brown, continuous, often torulose and crooked above and subdentate, 25—35 x 4 *u*; conidia slender, nearly hyaline, nucleolate, becoming 4—6-septate, 70—80 x 3 *u*. The tufts of hyphæ form minute black specks, easily seen with a pocket lens.

CERCOSPORA DIFFUSA, E. & E.—On leaves of *Physalis lanceolata*. Manhattan, Kans., July, 1887, W. T. Swingle. Spots none; hyphæ amphigenous but mostly hypophyllous, simple, short, 30—40 x 4—5 *u*, continuous, olivaceous, torulose and obtuse above, densely fasciculate in minute, punctiform tufts, which are scattered over the greater part of the leaf, but more densely collected in irregular groups and patches of one-half cm. or more in extent and causing the leaf at these points to turn slightly yellowish; conidia subcylindrical, slightly attenuated above, mostly 50—80 x 4 *u*, but sometimes elongated to 90 and 100 *u* and then

more distinctly attenuated above, granular, subolivaceous and becoming finally 4—6-septate. The microscopical characters do not differ greatly from those of *C. Physalidis*, Ell., but that species is on definite spots and the hyphæ are rather longer and paler.

CERCOSPORA FRAXINEA, E. & E.—On dried-up leaves of Ash. Manhattan, Kans., July, 1887, W. T. Swingle. Spots amphigenous, but more distinct below, indefinite or limited by the veinlets, mostly confluent, occupying considerable areas of the leaf, subolivaceous; tufts amphigenous, punctiform, densely crowded; hyphæ closely tufted, spreading, olivaceous, more or less crooked, 30—40 x 5—6 *u*, at length more or less septate; conidia cylindrical or at length slightly attenuated above, 1—3-septate, subolivaceous, mostly 25—35 x 5—6 *u*, but some of them reaching 50 *u* long and then more attenuated above. This is allied to *C. fraxinites*, E. & E., but that is on definite spots and has the hyphæ much shorter and conidia narrower. *C. superflua*, Ell. and Holw., also resembles this somewhat, but differs in its much longer (75 *u*) conidia, which are more deeply colored and have a long attenuated tip.

CERCOSPORA SEDOIDES, E. & E.—On living leaves of *Penthorum sedoides*. Manhattan, Kans., July, 1887, W. T. Swingle; Iowa, Dr. Halsted. Amphigenous, forming indefinite and inconspicuous, slightly rusty colored spots ¼—½ cm. in diameter, more distinct above and more or less confluent and always quite indistinct, giving the leaf a sickly, ferruginous tint; hyphæ arising mostly through the stomata of the leaf in scanty, spreading tufts, 15—20 x 2½—3 *u*, continuous, subfuscous, subdenticulate and subundulate above or nearly entire; conidia slender, obclavate-linear, yellowish-hyaline, 2—4-septate, mostly 40—55 x 2½—3 *u* wide.

CERCOSPORA SUBSANGUINEA, E. & E.—On leaves of *Smilacina Canadensis*. British Columbia, June, 1887, Prof. John Macoun. Spots amphigenous, subelliptical, light ferruginous, thin, becoming paler in the center, 2—3 millim. in diameter, subdefinite, scattered or subconfluent; tufts hypophyllous, minute, scattered, light pale red; hyphæ pale, reddish, 50—70 *u* long, slender (mostly less than three *u* thick) imperfectly branched above; conidia subcylindrical, 20—30 x 3—4 *u*, nucleate, mostly obtuse at the ends. Resembles somewhat *C. cruenta*.

CERCOSPORA ATRA, E. & E.—On living leaves of *Diospyrus Virginiana*. Faulkland, Del., August, 1887, A. Commons. Spots amphigenous, black, subangular, 1—5 millim ; hyphæ hypophyllous, in minute tufts, arising from a tubercular base, 40—75 x 3—4 *u*, continuous, dark, denticulate and subgeniculate above; conidia obclavate, curved, olivaceous, 2—3-septate, 35—55 x 3 *u*. Quite distinct from *C. Diospyri*, Thum., on account of its definite black spots and shorter conidia.

CERCOSPORA SEMINALIS, E. & E.—In spikelets of *Buchloe dactyloides*. Manhattan, Kans., July, 1887, W. T. Swingle. Forming a compact, olivaceous mass enclosed by the spines of the involucre. The mycelium penetrates the seed, which it blackens and destroys, sending up between the tips of the enclosing paleæ a dense growth of fertile hyphæ, which are of a pale olivaceous color, very long, branched and obliquely truncate above, septate below and bear at their tips the subhyaline, obclavate, granular, becoming 3—5-septate, 80—110 x 6—7 *u* conidia.

CERCOSPORA COFFEICOLA, B. & C.—On living coffee leaves. Guatemala, Comm. Prof. F. L. Scribner. Spots amphigenous, 2—3 millim. in diameter, with a white or at least light-colored center and reddish-brown margin; hyphæ mostly epiphyllous, tufted on the small tubercular base, 50—75 x 4 *u*, with 2—3 septa, fuscous but also elongated to 100 or even 350 *u*, nodulose and toothed above; conidia only sparingly observed; the few seen were hyaline, 2—4-septate, 75 x 3 *u* (at the thickest end).

CERCOSPORA BRACHIATA, E. & E.—On leaves of *Amarantus retroflexus*. Faulkland, Del., August, 1887, A. Commons. Maculicolous; spots amphigenous, dark brown (darker above), becoming whitish in the center, rather indefinitely limited, 3—5 millim. in diameter; hyphæ amphigenous, tufted on a small tubercular base, pale brown, straight, cylindrical, faintly septate, spreading, 100—200 x 3½—4 *u*; conidia slender, faintly multiseptate, hyaline, often reaching 200 *u* long and about 3 or 3½ *u* thick below. In the early stage of growth, the tufts of hyphæ appear like minute, black perithecia thickly scattered over the spots, but when the conidia appear, they assume a more effused appearance, like a dark gray, velutinous pubescence. The species is allied to *C. canescens*, E. & M.

CERCOSPORA OBESA, E. & E.—On leaves of *Cnicus*. Manhattan, Kans., July, 1887, W. T. Swingle. Maculicolous; spots irregular, gray-brown, 2—5 millim. in diameter, soon confluent, obscured below by the white, woolly tomentum; hyphæ oblong-cylindrical, simple and continuous, hyaline (or nearly so), 45 x 6—7 *u*, nearly entire above, densely cæspitose in large, crowded, cinereous tufts, covering the upper side of the spots; conidia oblong-obclavate, obtuse at each end, mostly one-septate, but a few were seen with 4—5 septa, constricted at the septa, 50—60 x 5—6 *u*.

CERCOSPORA HELIOTROPII, E. & E.—On leaves of *Heliotropium curassavicum*. Albuquerque, New Mexico, S. M. Tracy, No. 384. Amphigenous; hyphæ loosely fasciculate, short (15—20 *u*); tufts effused, giving the leaf at length a dirty brownish color; conidia oblong-cylindrical, 1—3-septate and sometimes constricted at the septa, 20—50 x 4–6 *u*, subhyaline, with an olivaceous tinge. There are no definite spots, but the leaves at first are blotched with yellow in the affected parts, which are mostly the upper half of the leaf, though the fungus also attacks the stems.

CERCOSPORA CEPHALANTHI, Ell. & Kell.—Fine, well-matured specimens of this species were collected at Faulkland, Del., Oct. 3, 1887, by Mr. Commons and show that the mature conidia are olivaceous-brown, 5—7-septate, 35–50 x 4 *u*; the hyphæ olive-brown (almost black under the hand lens) form erect, compact tufts mostly confined to the upper side of the leaf.

CERCOSPORA DEUTZIÆ, E. & E.—On leaves of *Deutzia gracilis*. Faulkland, Del., September, 1885, Commons, No. 199. Spots amphigenous, small (1—2 millim.), white above, with a thick, raised border, more

obscure beneath; hyphæ in sparsely-scattered tufts, brown, septate, more or less bent and subdenticulate above, about 100 x 3 *u*; conidia hyaline, slender, multiseptate, mostly recurved above, very long (250—300 x 3 *u*).

CERCOSPORA HELIANTHI, E. & E., has also been found by W. T. Swingle on *H. rigidus* (1085) and *H. doronicoides* (1073) differing from the Missouri specimens (JOURN. MYCOL., III, p. 20) in being amphigenous and having the conidia longer (100—150 *u*.)

CERCOSPORA MENISPERMI, Ell. & Holway.—On living leaves of *M. Canadensis*. Decorah, Iowa, June, also at Manhattan, Kans., July, 1887, by W. T. Swingle. Hypophyllous, appearing at first on small, indefinitely-limited, dark brown spots, which finally become orbicular (3—5 millim. in diameter), mostly concave below and more or less confluent, so that the leaf appears more or less blackened and dead; hyphæ nearly straight, pale brown, mostly continuous, 75—80 x 4 *u*, with a few shoulder-like notches above, forming tufts arising from a subspherical, tubercular base about 35 *u* in diameter; conidia obclavate, 40—60 x 5—7 *u*, pale brown, nucleate, becoming 3—5-septate. Many of the conidia are much shorter, obovate or oblong-elliptical (15—25 x 5—7 *u*), 1—3-septate, resembling the conidia of a *Cladosporium*.

CERCOSPORA CALLÆ, Pk. & Clinton.—This has been sent by Mr. Commons from Delaware, on *Peltandra Virginica*, agreeing well with authentic specimens on *Calla palustris*. In Journ. Mycol., I, p. 22, the hyphæ are said to be "short" In the specimens from Prof. Peck, they are 60—90 x 6 *u*, and in the Delaware specimens, they are 70—110 *u* long.

CERCOSPORA TABACINA, E. & E.—On *Rudbeckia triloba*. Ames, Iowa, Dr. B. D. Halsted. Mostly hypophyllous, forming tobacco-brown patches limited by the veinlets of the leaf; hyphæ tufted (tufts subeffused), brown, slender, septate, abruptly bent, often with one or more rudimentary branches above, 100—150 x 4 *u*; conidia with a brownish tint, varying in size and shape from oblong, 25 x 4—5 *u* and one-septate to obclavate, 50—75 x 4—5 *u*, three septate. This differs from *Cercospora Helianthi*, E. & E., in its tobacco-brown color and in being limited by the veinlets.

CERCOSPORA DALEÆ, Ell. & Kellerman.—On dead stems of *Dalea laxiflora*. Kansas, July, 1887, Kellerman & Swingle (954). Hyphæ simple, brownish, straight, subdenticulate above, 25—30 x 4—5 *u*, forming dense, sphæriæform tufts subseriately arranged or gregarious in elongated patches; conidia obclavate-cylindrical, brownish, 1—2-septate, 30—40 x 3—4 *u*. The part of the stem occupied by the fungus becomes cinereous-brown.

CERCOSPORA ASCLEPIADORÆ, Ell. & Kellerman.—On fallen leeves of *Asclepiodora viridis*. Kansas, July, 1887, Kellerman & Swingle, 954 bis. Amphigenous; hyphæ simple, dark brown, short (15—25 *u*), fasciculate in densely crowded tufts, which form nearly black patches, indefinitely limited or bounded partly by the veinlets; conidia sublanceolate, brown, multiseptate, 70—80 x 4—5 *u*.

CERCOSPORA CHAMÆCRISTA, Ell. & Kellerman.—On leaves and pods of *Cassia chamæcrista.* Manhattan, Kans., October, 1887, Kellerman & Swingle (1126). Hypophyllous; hyphæ loosely fasciculate, coarse, pale brown, sparingly septate, 50—70 x 5—6 *u*, abruptly bent and subnodulose above; spots none, tufts effused and soon spreading over the entire lower surface of the leaf, which then assumes a brown, scorched look; conidia subcylindrical, smoky-hyaline, 1—3-septate and sometimes constricted at the septa, 35—55 x 5—7 *u*.

CERCOSPORA PACHYPUS, E. & E. JOURN. MYCOL., III, p. 104.—A form of what appears to be this species has been found in Kansas (Kellerman & Swingle, No. 1127, on leaves of *Helianthus lenticularis*, having the conidia 1—3-septate, the tufts of hyphæ rather larger and longer and the pallid-yellowish spots at first distinctly visible on both sides of the leaf.

The following may also be added to the list of North American species:

C. IPOMÆÆ, Winter.—Fungi Eur., 3585, on *Ipomœa pandurata.* Missouri (Galloway).

C. HELVOLA, Sacc.—On *Trifolium repens*, at Newfield, N. J.

NEW IOWA FUNGI.

BY J. B. ELLIS AND B. D. HALSTED.

CERCOSPORA LATERITIA, Ell. & Halsted.—On living leaves of *Sambucus pubens.* Ames, Iowa, September, 1887, B. D. Halsted. Hypophyllous, in indefinite, pale, brick-colored patches, which soon become confluent, covering the greater part of the lower surface of the leaf, which is variegated above with brownish spots, which become more or less confluent and darker and finally nearly black; hyphæ coarse, 50—70 x 8—10 *u*, branching and septate, arising in spreading tufts through the stomata of the leaf and more or less interwoven and matted together; conidia mostly cylindrical and straight, with ends obtuse, 2—6-septate and generally constricted at the septa, reddish-brown, 50—80 x 6—8 *u*, occasionally longer (100 *u* or over) and then attenuated above. This is closely allied to *C. ferruginea*, Fckl., and *C. racemosa*, E. & M., but is a coarser species than either of these, though in color and general appearance it much resembles the latter.

CERCOSPORA LYCII, Ell. and Halsted.—On *Lycium vulgare.* Ames, Iowa, September, 1887, B. D. Halsted. Spots amphigenous, yellowish-brown, becoming thin and white in the center, 2—4 millim. in diameter, discoid, with a definite, raised margin; hyphæ mostly epiphyllous, yellowish-brown, paler above, septate, 80—120 x 4 *u*, nearly straight, but more or less shouldered and toothed above, forming erect tufts arising from a small tubercular base; conidia slender, 80—150 x about 4 *u*, hyaline, continuous or faintly 3—4 or more septate.